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INFORMATION ON THE SPRUCE BUDWORM  
IN IDAHO AND MONTANA

Until a few years ago the spruce budworm (Cacoecia funiferana Clem.) was regarded as an eastern insect and was not feared as a potential problem in our western forests. In 1922, however, this insect was discovered in two regions in Idaho and the following season it was found in the Yellowstone National Park, and had apparently been established throughout Idaho, Montana, and Wyoming. In addition, it has been reported from New Mexico.

In our western forests the larvae of the spruce budworm have been collected from white fir, Douglas fir, Engelmann spruce, western larch, western hemlock, white pine, yellow pine, and lodgepole pine. With most of these hosts only the new needles are eaten, the attack extending to the old foliage only when there is a shortage of food material. In this region the preferred hosts are apparently Douglas fir and white fir. The severest damage which has occurred from the present outbreak of this insect in the West has been in pure Douglas fir stands. In the Yellowstone National Park a pure stand of Douglas fir, several hundred acres in extent, has been completely killed by the spruce budworm during the past few years.

The adult insect, which is a small brownish moth with a wing expanse of approximately 1 inch, is to be seen flying early in August. Eggs are laid in light green, inconspicuous masses on the under side of the needles. These eggs hatch in 10 to 12 days and the young larvae construct small cocoons under flakes of bark or other sheltered places in which they pass the winter. It is not definitely known whether these young larvae feed before hibernation or not, but if they do, it is very sparingly. The following spring the overwintering larvae leave their cocoons and bore into the buds just as they are opening. The worms develop rapidly and are usually full grown by the last of July. When mature the caterpillars, or worms, are approximately 1 inch in length, of a deep brown color, with pale green markings and numerous wartlike growths along the sides. When mature the larvae pupate within chrysalids attached by a few silken threads to twigs and other objects. The pupal stage of this insect lasts from 10 to 12 days.

Attack by the spruce budworm is easily recognized by the blighted appearance of the tips of the limbs where the new needles have been destroyed. Nests are constructed by the caterpillars by binding together the needles, which have been gnawed off at the base, with silken threads. When disturbed



they hide in these nests and if touched drop from the limb and hang by a thread on which they climb back to their homes.

Controlling epidemics of this insect by artificial methods seems to be impracticable because of the expense involved. Outbreaks of the spruce budworm cover thousands of acres which would have to be sprayed or dusted with a stomach poison in order to destroy the feeding caterpillars. With the development of aircraft it is possible that outbreaks can be controlled by dusting from such equipment. At this time, however, the only feasible control lies in the protection, by spraying, of trees of particular value around parks, camp sites, etc. For the protection of trees of this character the following formula should be used:

Fish oil - - - - 1 gallon  
Arsenate of lead powder - - - 25 pounds  
Water - - - - - 400 gallons

This spray should be applied as the new buds are opening.

In our Eastern States and Canada the spruce budworm has been responsible for the destruction of an enormous quantity of timber. The extent of the loss throughout the Western States as a result of the various outbreaks of this insect during the past few years is not definitely known. What the present and subsequent epidemics may hold in store for us is problematical. We may be assured, however, that the spruce budworm is now established as an important Western forest insect and will need to be considered in future plans of intensive forestry.

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